



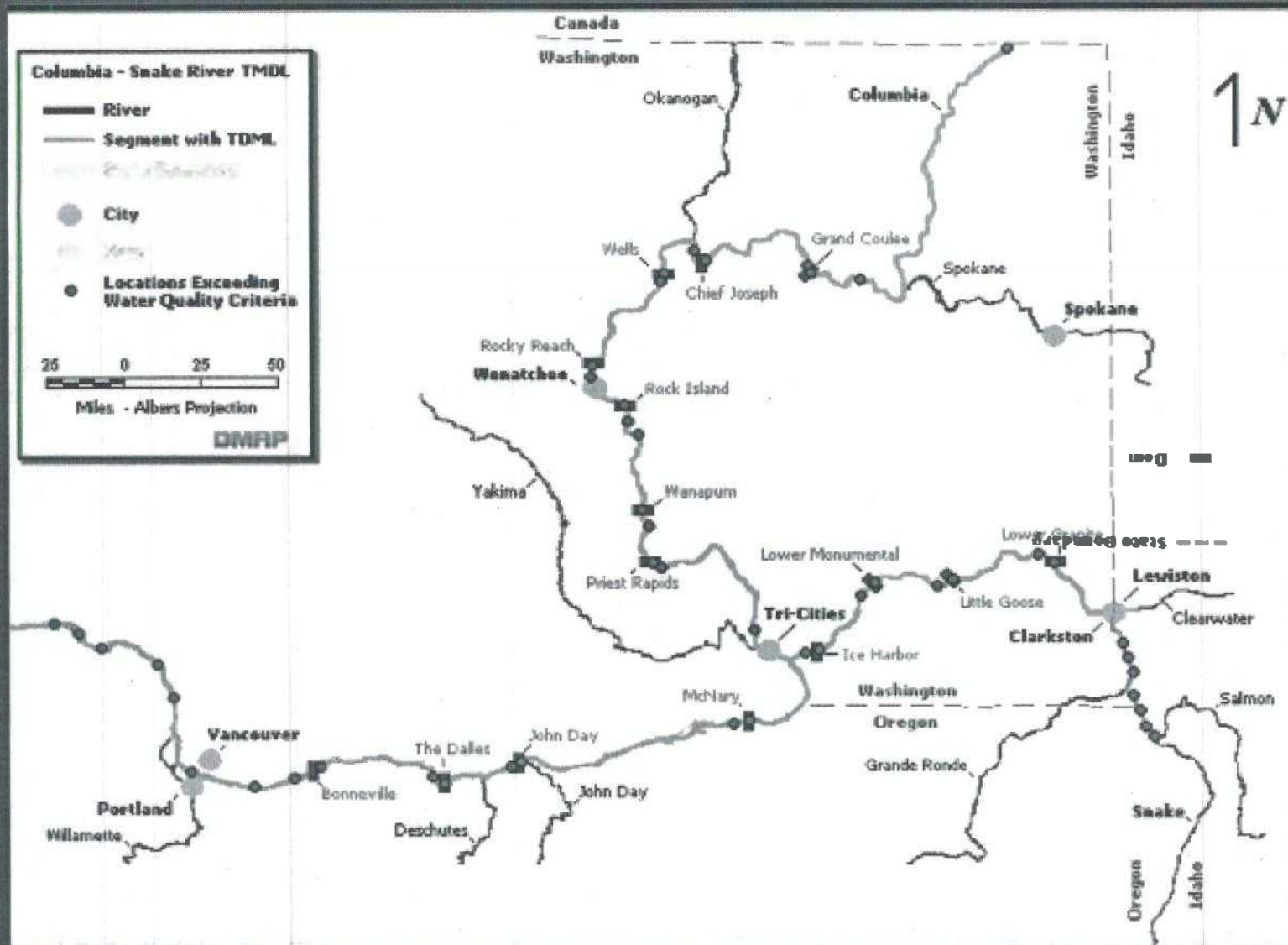
Columbia/Snake Rivers

Temperature TMDL

U.S. EPA Region 10



Geographic Scope



Important Term

Site Potential Temperature (SP):

Temperature that would occur in the main stems if the effects of human activity on temperature within the main stems in the TMDL Project Area is eliminated.

Summary of Temperature Goals

- At Columbia River Mile 4:
- 0.14 °C over Site Potential Temperature (SP) if SP exceeds 20 °C;
- 1.1 °C over SP if SP is less than 20 °C.

Summary of Temperature Goals

- Where Salmonid Spawning Occurs along the Oregon/Washington Border:
- 0.14°C over SP if SP exceeds 12.8°C between October 1 and May 31;
 - The TMDL establishes that salmonid spawning occurs upstream of RM 112 (I 205 bridge).

Summary of the Allocations

- The rivers are divided into 21 reaches;
- Each reach receives an allocation in terms of temperature increase over site potential.

Summary of the Allocations

- That allocation represents the temperature increase allowed to result from human activities in the main stems.
- The allocations are established to meet the temperature goals.

Schematic of Reach Allocations

Site Potential Temperature
*Includes Tributaries
(Non-point Sources)*

Reach Allocation
*Temperature Increase
over Site Potential*

**Increase from
Dams**

**Increase from
Point Sources**

Summary of Allocations

- The reach allocations are based on:
 - the temperature increase caused by existing point sources;
 - an additional 20 MW of heat energy to account for general NPDES permits and future growth;

Summary of Allocations

- an allocation for the dam in the reach;
- tributaries are allocated their existing loads and are treated as part of the site potential temperature.

Example Allocations by Reach

<u>Site</u>	<u>Increase</u>	<u>WLA</u>	<u>LA</u>
Gr Coulee	0.0109 °C	0.0009 °C	0.01 °C
Ch Joseph	0.0109 °C	0.0009 °C	0.01 °C
Wells	0.0105 °C	0.0005 °C	0.01 °C
Rocky R	0.0106 °C	0.0006 °C	0.01 °C
Rock Is	0.0109 °C	0.0009 °C	0.01 °C
Wanapum	0.0104 °C	0.0004 °C	0.01 °C
Priest R	0.0904 °C	0.0004 °C	0.09 °C

Wasteload Allocations

- 106 point sources with Individual permits:
 - 95 with very little temperature impact are grouped by reach and given group allocations;
 - 11 facilities are given individual allocations.

Wasteload Allocations

- 158 point sources with general permits are accounted for in the group allocations.
- WLA are established in megawatts (MW).

Example of WLA

River Reach/ <u>Facility</u>	Group <u>Allocations</u>	Individual <u>Allocations</u>
Priest R to McNary	244.13 MW	791.4MW
Agrium Bowles Rd		206.8 MW
Agrium GF Rd		384.5 MW
Boise Cascade W		200.1 MW
McNary to John D	59.81 MW	0.0 MW
John D to T Dalles	20.73 MW	0.0 MW

Effects on River Users

- Dams are allowed essentially no increase over site potential:
 - 0.09 °C for Priest Rapids;
 - 0.01 °C for the other dams.

Effects on River Users

- Point Sources with individual permits are generally allowed their existing discharges.
- Point sources with general permits are allowed their existing discharges.

Effects on River Users

- Some future growth is allowed via the group allocations.
- Tributaries are allowed their existing loads.

Effects on River Users

- The majority of the non-point temperature impacts are via the tributaries.
- Therefore they are given their existing loads in this TMDL.
- They may receive different load allocations when the tributary TMDLs are completed.

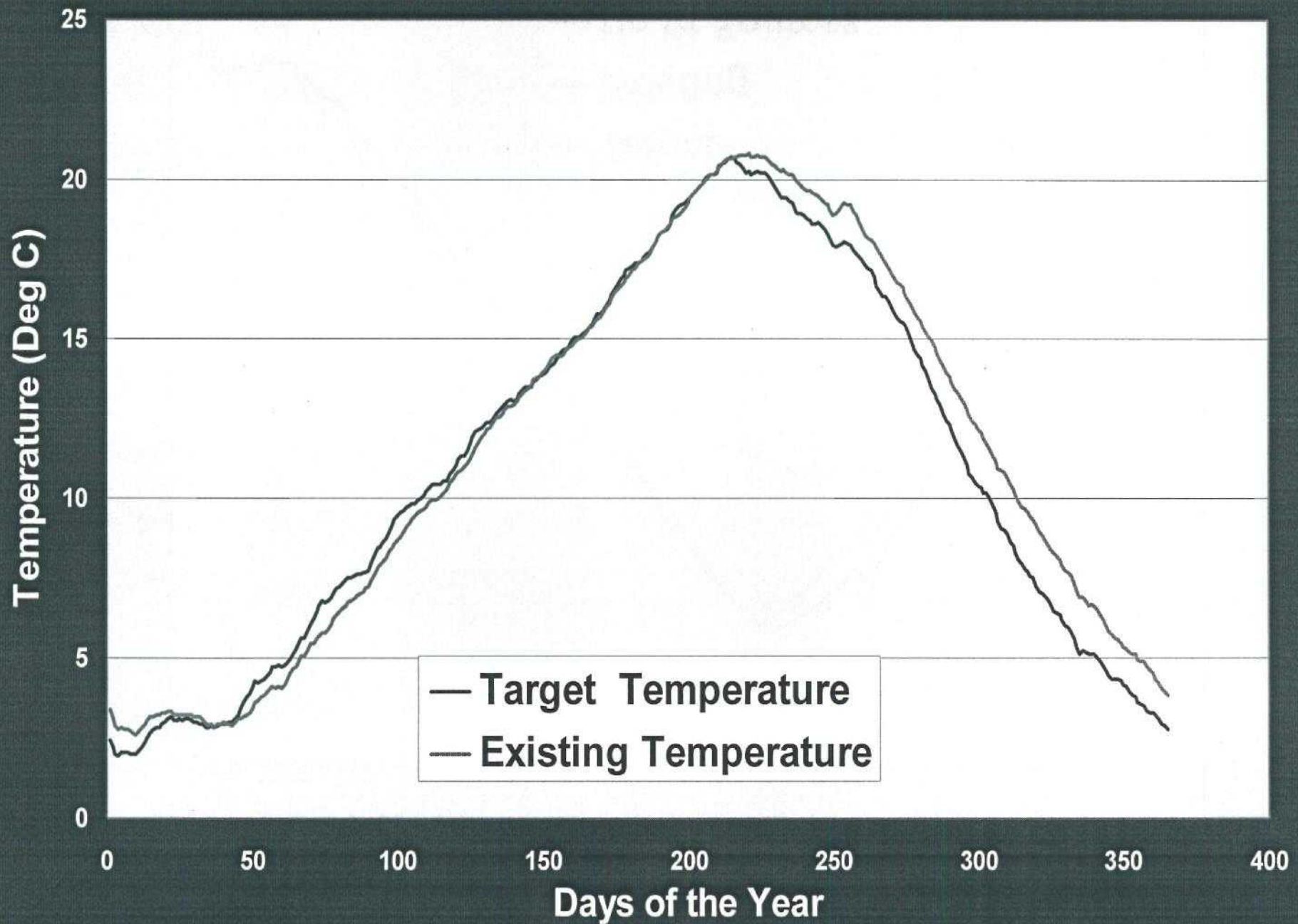
Tributaries

- Why are tributaries loads not established?
 - WQS based on natural conditions;
 - TMDL focus is on the main stem human activities;
 - Changing tributary temperatures would have little effect on the temperature increases allowed.

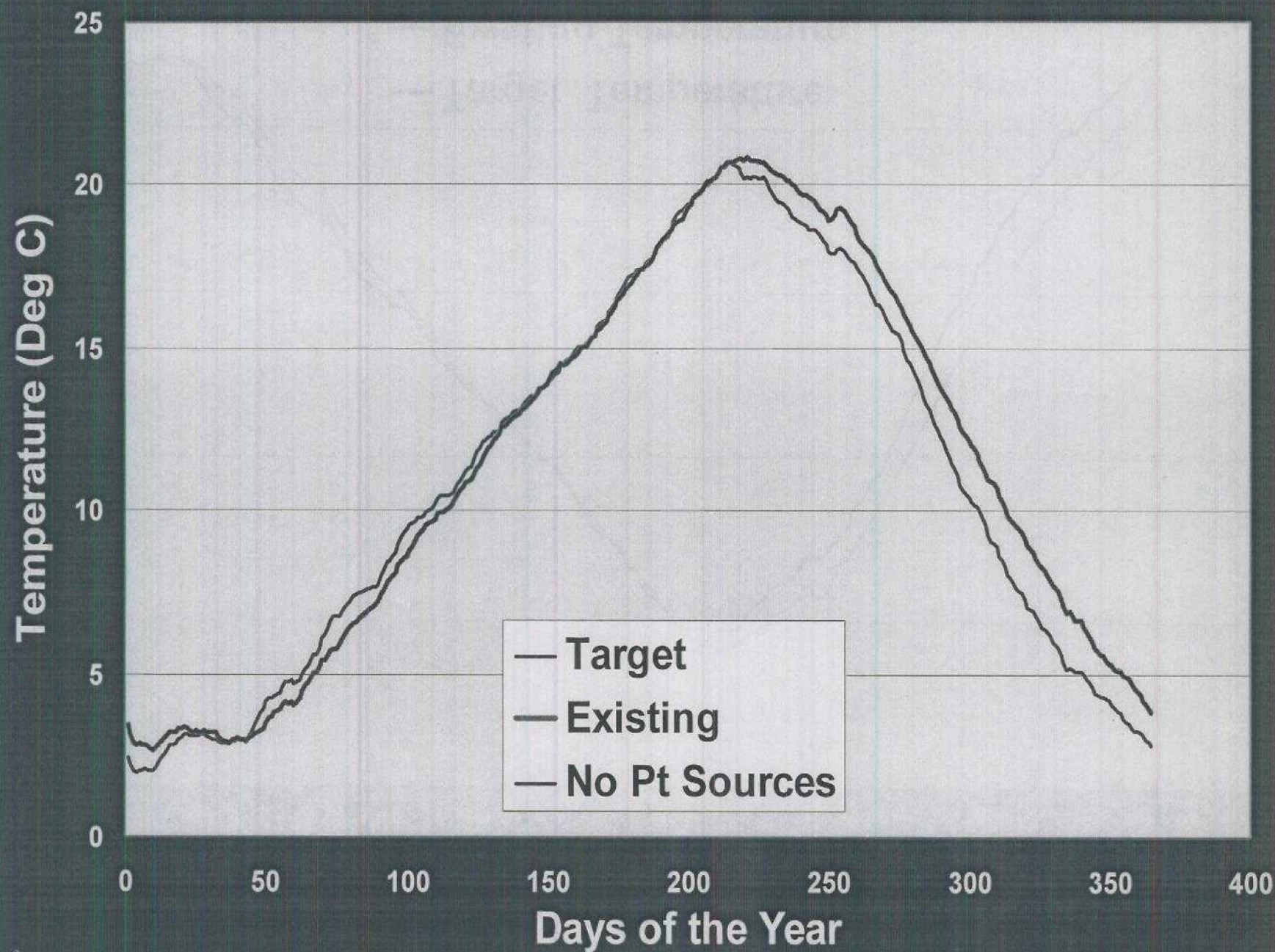
Dams VS Point Sources

- Why no allocation for dams and full allocations for point sources?
 - Dams have much greater impacts on temperature than the point sources;
 - Limiting the point sources would not benefit the dams.

Simulated Mean Temperatures at Columbia River Mile 42



Simulated Mean Temperatures at Columbia River Mile 42



Potential Effect of this TMDL on Dams

- Varies with the effect of the dams on temperature.
- Three fairly distinct groups of dams.

Potential Effect of this TMDL on Dams

Dams that clearly increase temperature by more than a degree Centigrade:

Grand Coulee

John Day

Lower Granite

Little Goose

Lower Monumental

Ice Harbor

Potential Effect of this TMDL on Dams

Dams with highly variable impacts up to
a degree Centigrade:

Chief Joseph

Wanapum

Potential Effect of this TMDL on Dams

Dams with highly variable impacts from
no impact to 1/2 a degree Centigrade:

Wells

Rocky Reach

Rock Island

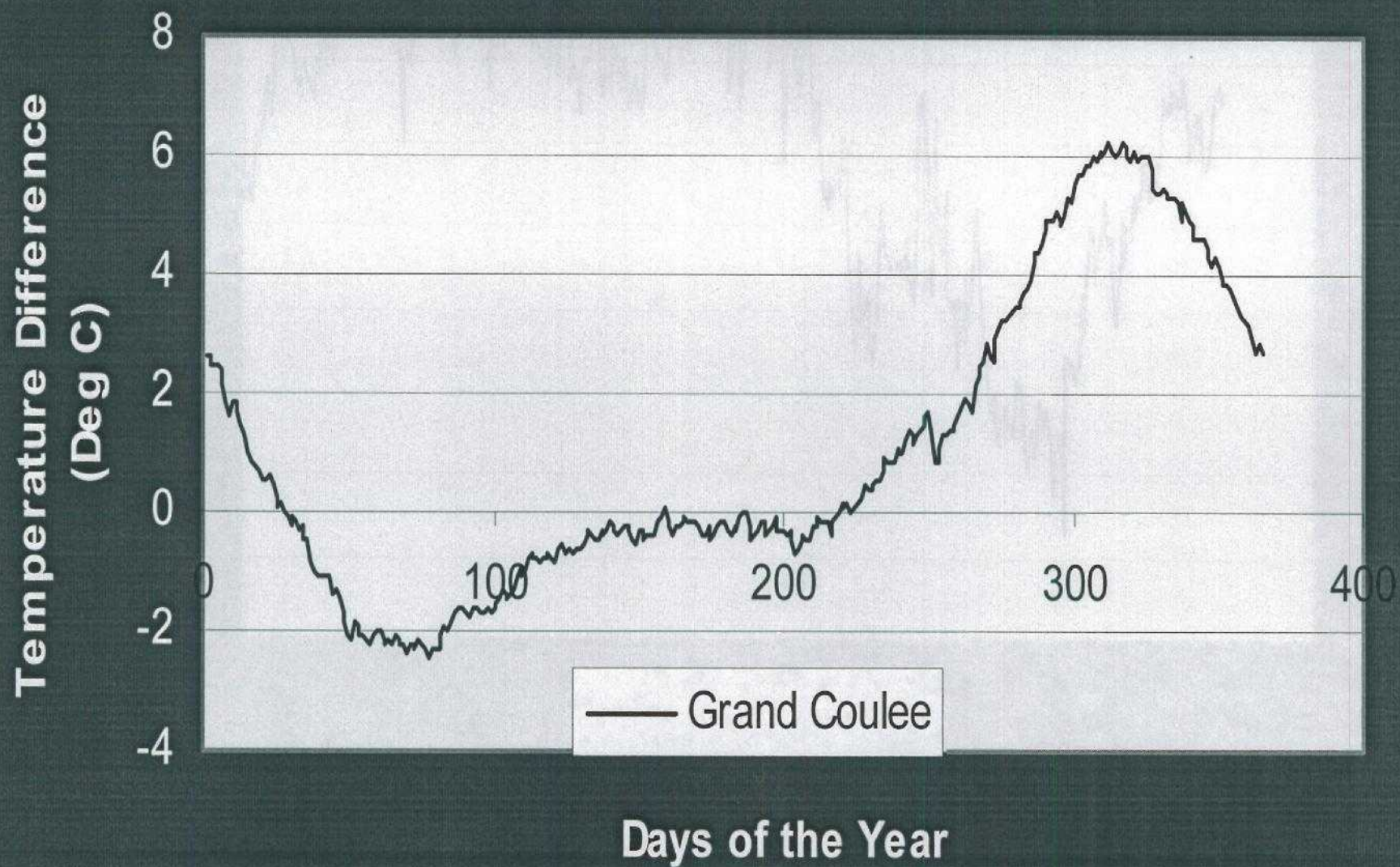
Priest Rapids

McNary

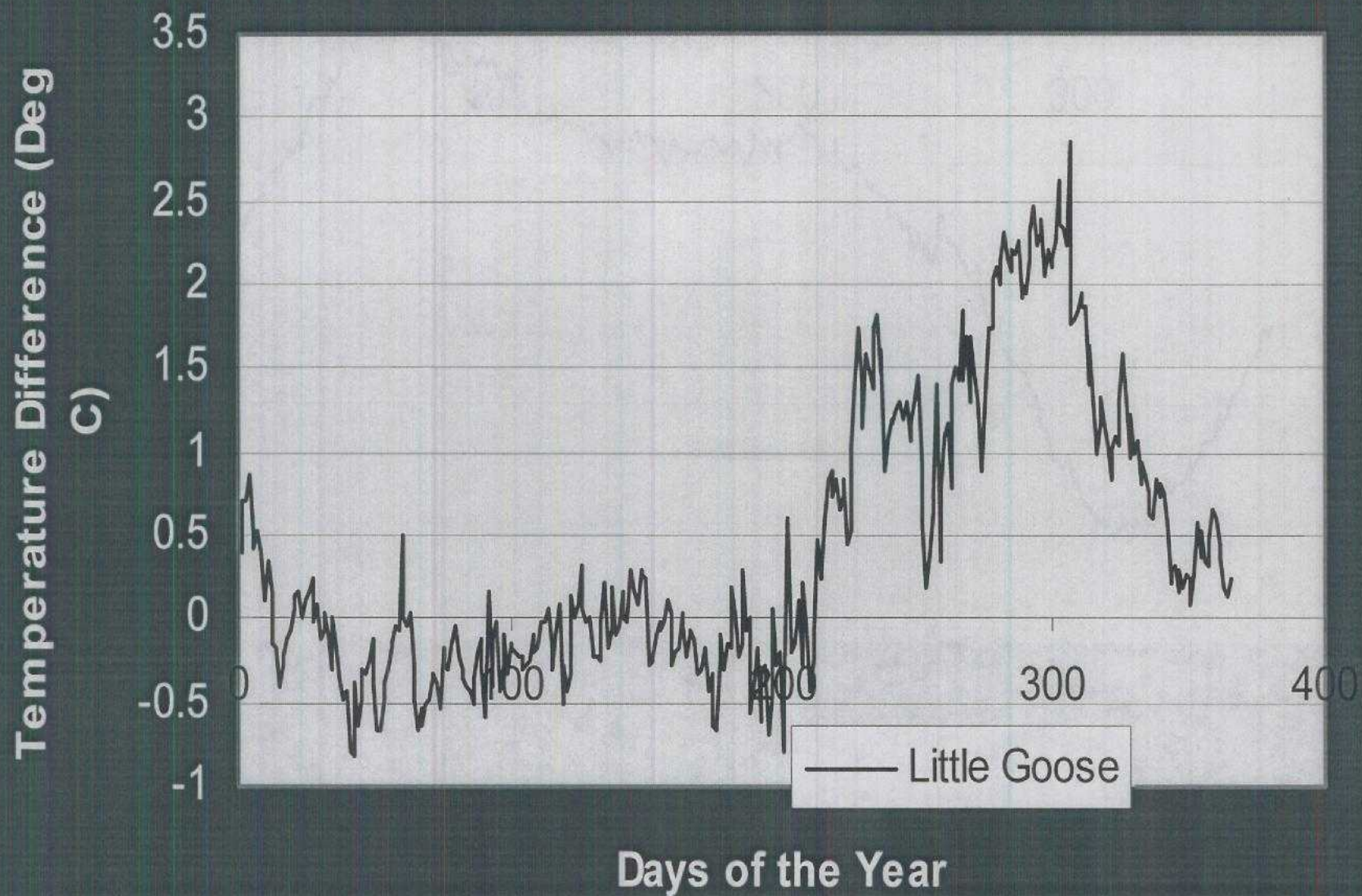
The Dalles

Bonneville

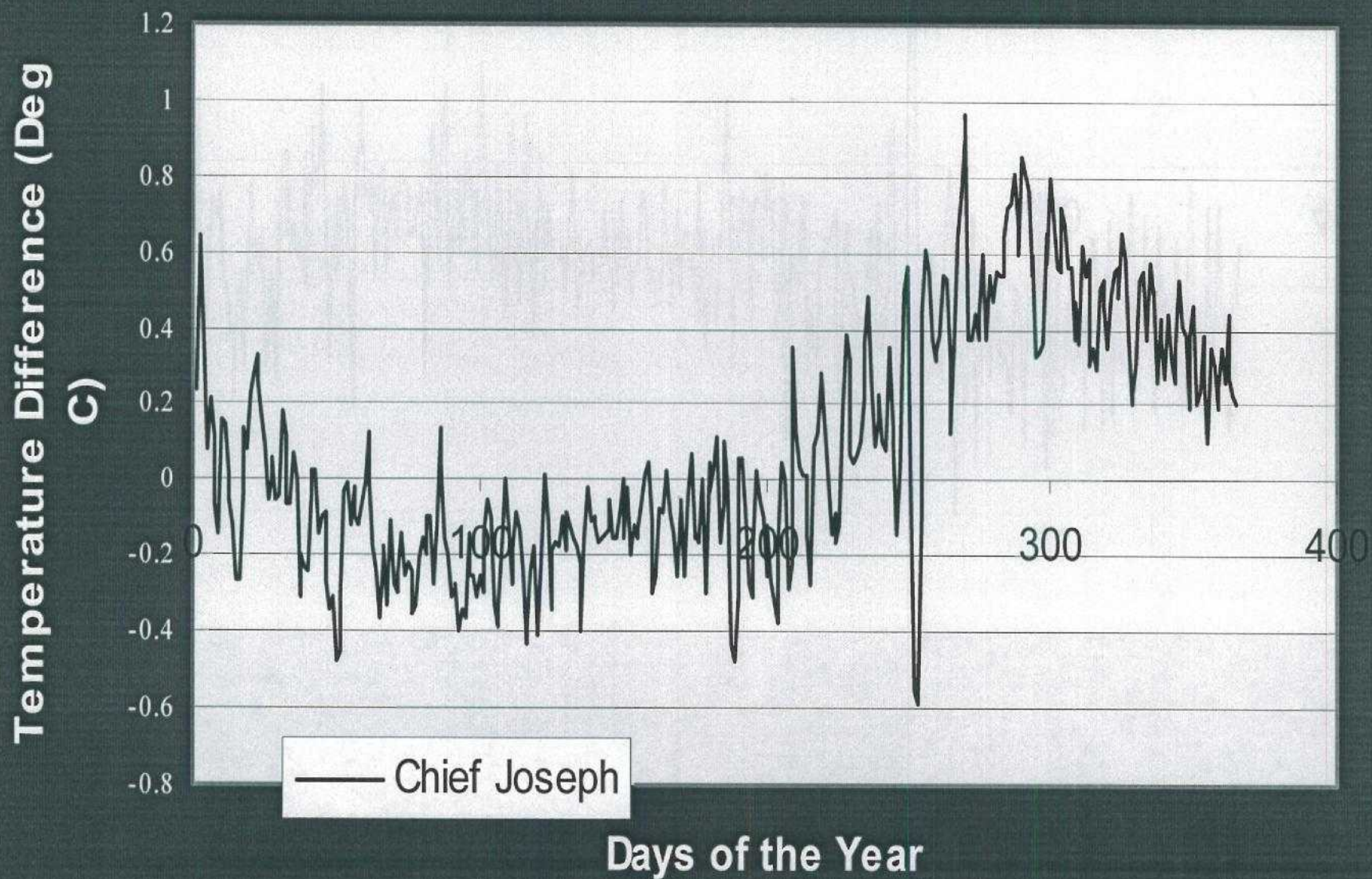
Temperature Difference at Grand Coulee: Existing - Site Potential - 30 Year Mean



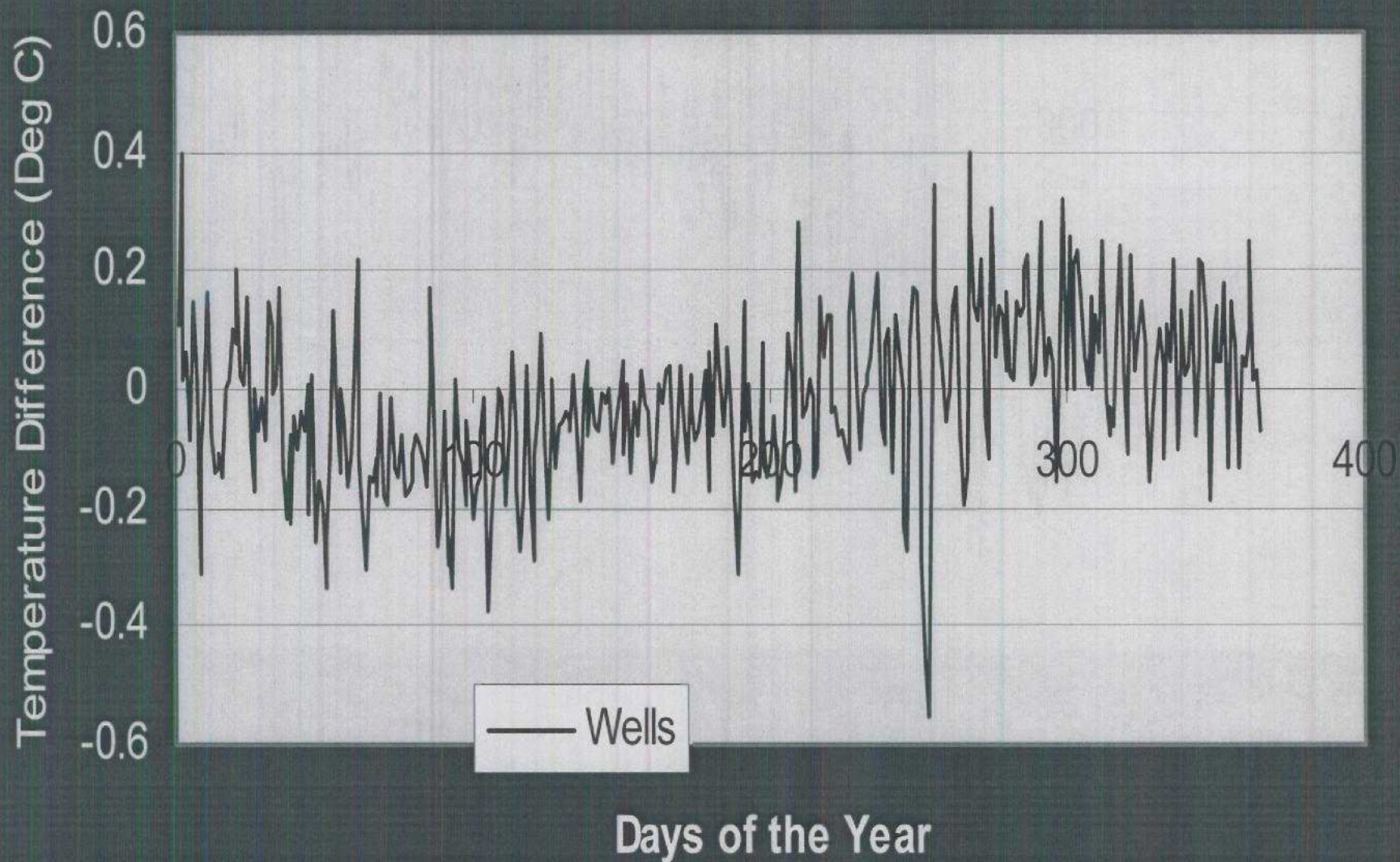
Temperature Difference at Little Goose: Existing - Site Potential : 30 Year Mean



Temperature Difference at Chief Joseph: Existing - Site Potential - 30 Year Mean



Temperature Difference at Wells: Existing - Site Potential : 30 Year Mean



Role of the TMDL

- quantify the temperature problem;
- define the target temperatures;
- determine the level of improvement needed.

Role of the TMDL

- The 2000 FCRPS BIOP includes an RPA for development of a Water Quality Plan to improve TDG and temperature in the main stems.
- The intent of this TMDL was to establish the goals for that water quality plan.

Next Steps

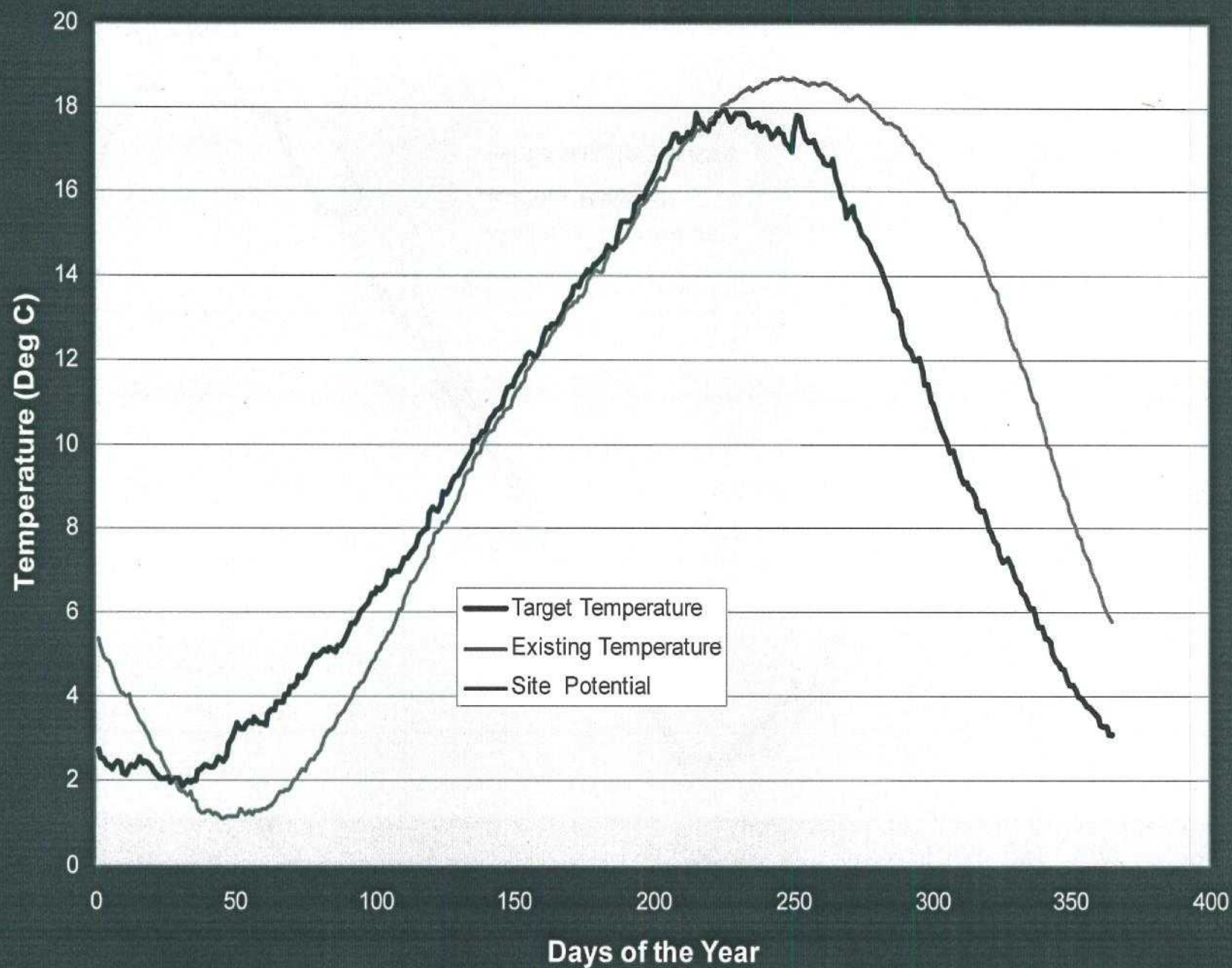
- TMDL implementation plan;
- The BIOP Water Quality Plan;

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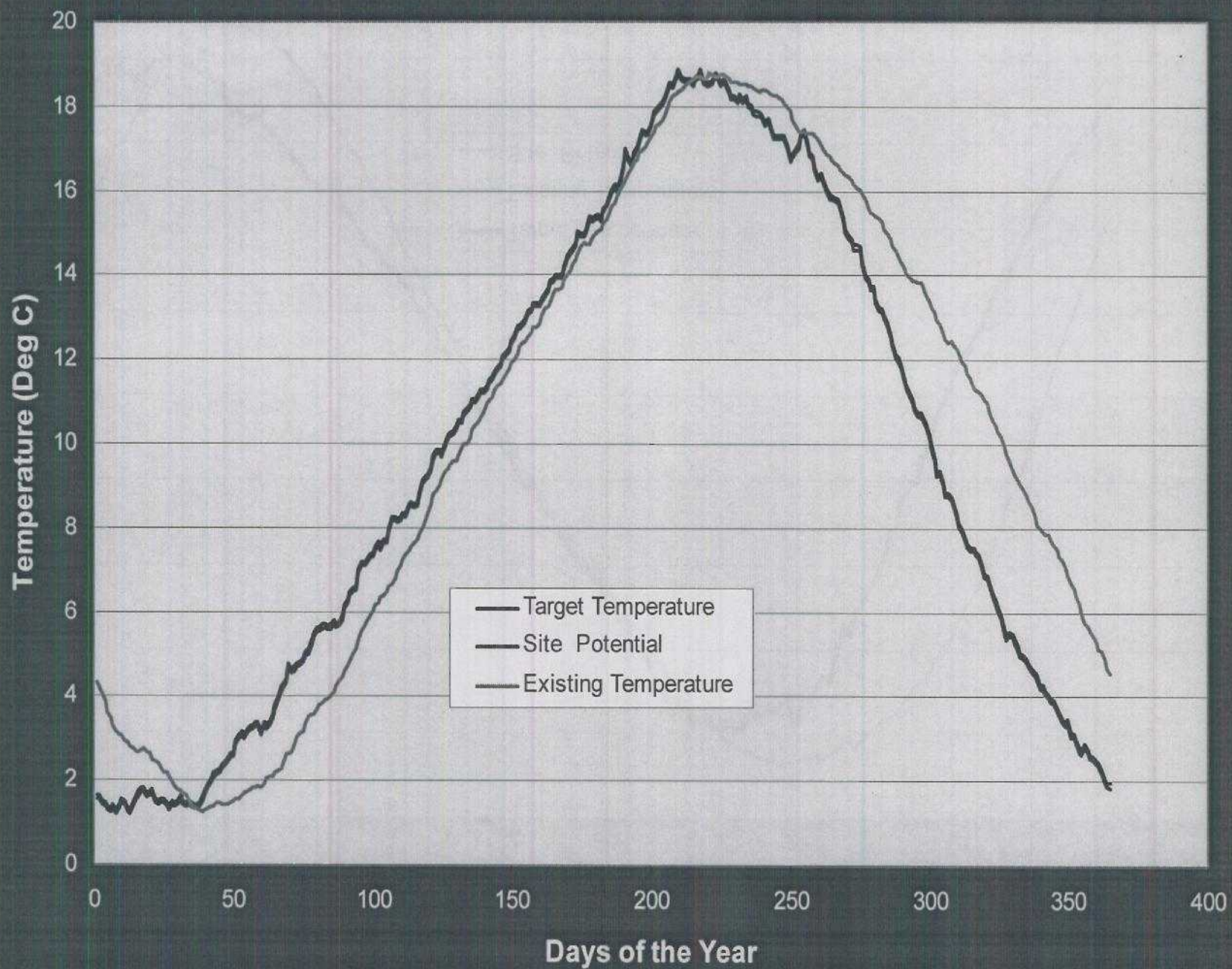
Next Steps

- Determine what can be done at dams to improve temperature;
- Determine the costs;
- Determine the benefits;
- Make a decision to improve the dams or recognize that improvement is not possible and amend the WQS.

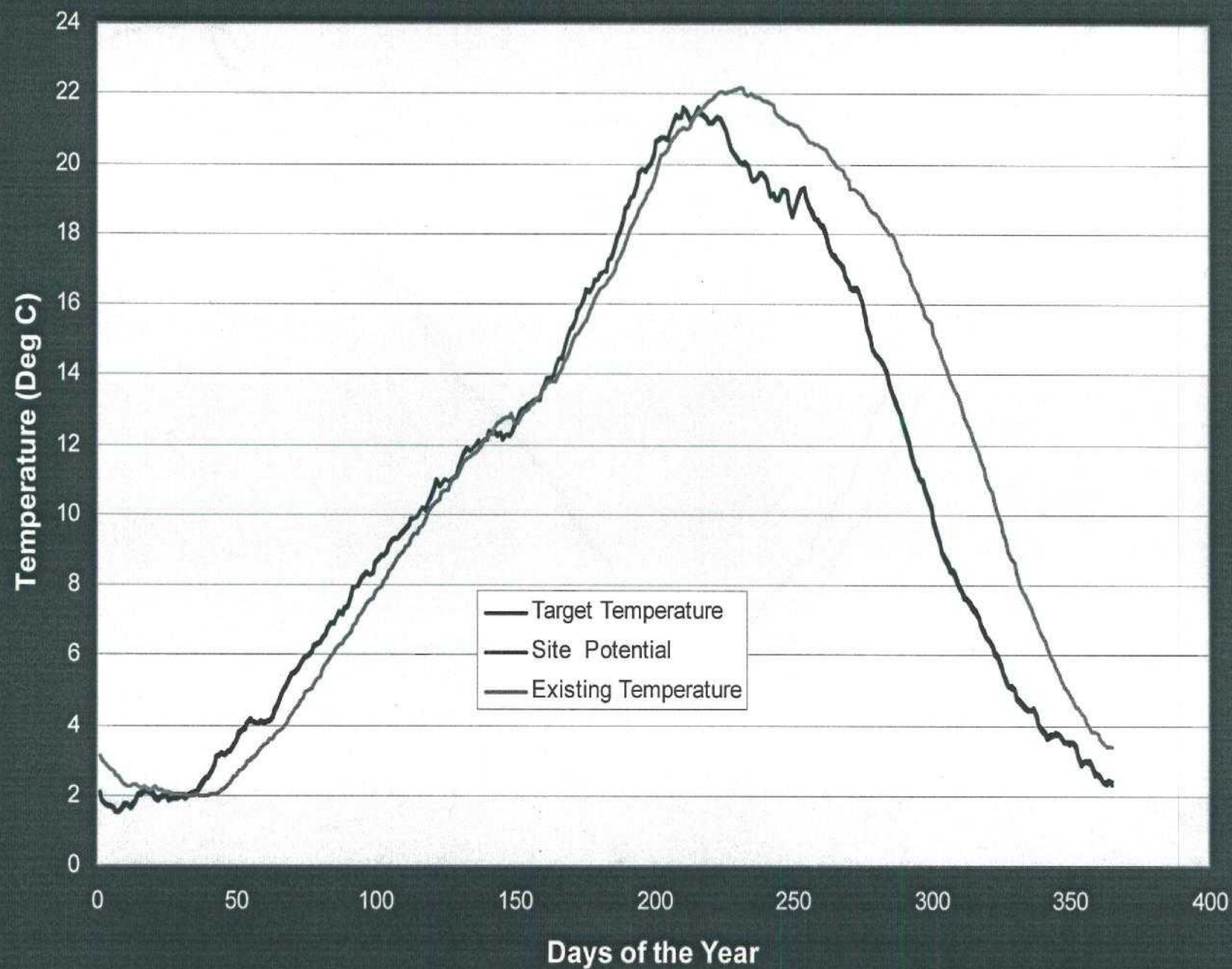
Simulated Site Potential, TMDL Target and Existing Temperatures at Grand Coulee: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Priest Rapids: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Ice Harbor: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Bonneville: 30 Year Means

